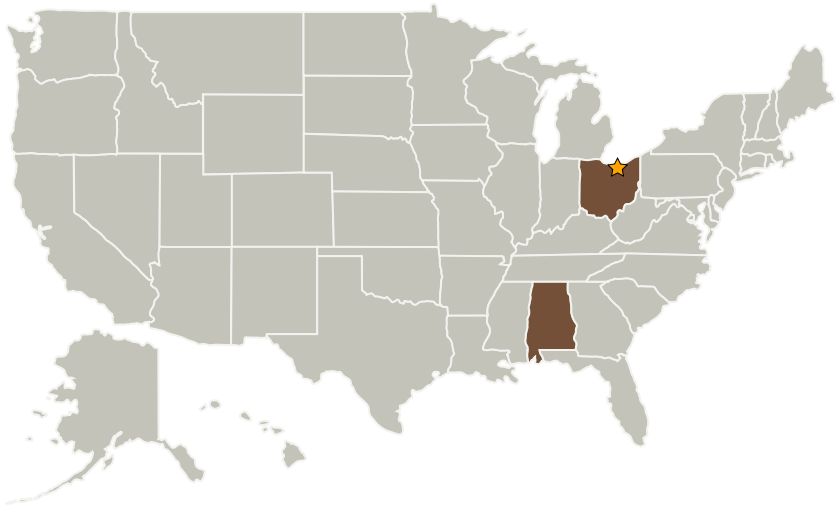
Multi-Use Coating for Abrasion Prevention, Wear Protection, and Lunar Dust Removal, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

The deleterious effects of lunar dust, typically less than 50 µm in diameter, have to be addressed prior to establishing a human base and long duration human presence on the surface of the moon. These effects include abrasion of seals, gaskets, motors, actuators, gimbals, bearings, blocking of optical windows, and coating of thermal control surfaces and solar panels with lunar dust. Negative physiological effects due to dust inhalation by astronauts must be mitigated. Issues related to lunar dust have been identified since the Apollo missions; however, no credible mitigation techniques have been implemented to date. The essence of this proposed activity is to develop a dual-use coating system - a highly wear resistant coating surface that can also perform as part of an electrically conductive circuit upon demand to minimize wear surface abrasion and, when electrically activated, repel fine lunar dust particles from wear surfaces, sealing surfaces, and complex geometries. Multi-use wear resistant surfaces are also applicable to space structures such as the trundle bearings on the space station solar arrays.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Plasma Processes, LLC	Supporting Organization	Industry Veteran-Owned Small Business (VOSB)	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.5 Particulate Contamination Prevention and Mitigation